

# Tom Ginsberg

## EDUCATION

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CLASS OF 2021    **B.A.Sc Engineering Physics**  
TREK SCHOLAR  
*University of British Columbia*

## NOTABLE COURSE AND PROJECT WORK

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### Software Projects

- **Echolib:** A capstone project for the UBC Robotics and Control Laboratory to systematize machine learning research for applications to point of care echo echocardiography.
- **DeepZAdapt:** A learnable Zonotope relaxation for  $L_\infty$  robustness certification of deep neural networks.
- **Drone Tree ID:** An industry sponsored deep Learning solution for automated segmentation and characterization of multi-modal forest data.

### Physics & Simulation Projects

- **Gravitational Trajectory Optimization:** An engine to simulate and optimize rocket trajectories using gravity assists.
- **FEALite:** A library for non linear finite element analysis.

### Autonomous Robotics

Completed a full mechatronics design project through the construction of functional autonomous robot. Design challenges included: autonomous sensing and navigation, crossing various gaps, locating and picking up objects and detecting and processing infrared signals.

### Notable Courses

**ETH:** Deep Learning, Reliable and Interpretable AI, Signals Models and Machine Learning, Physical Simulation  
**UBC:** Software Design, Data Structures and Algorithms, Quantum Mechanics, Electrodynamics, Optics, Statistical Mechanics, Fluid Mechanics, Thermodynamics, Solid Mechanics, Mechanical Design, Microcomputers, Control, Vector calculus, Advanced Partial Differential Equations, Mathematical Proof, Probability and Statistics, Complex Analysis, CMOS Design  
**Directed Study:** Real time systems and controls

## AWARDS ACHIEVEMENTS

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- Received Gordon Merritt Shrum Memorial Scholarship valued at \$6k. Given to two outstanding students in Physics upon recommendation of faculty.
- Completed one semester abroad at ETH Zurich, undertook various masters level courses in machine learning. Achieved a semester average of 96%.
- Received the Trek Excellence Scholarship every year for students ranked in the top 5% of their Faculty.

- Received the Charles and Jane Banks Scholarship for worthy and deserving students awarded on the recommendation of Faculty.
- Awarded for obtaining the highest overall and academic average in my high school graduating class.

## WORK EXPERIENCE

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### Medical AI Researcher

**Robotics and Control Lab** — 05/20 → current

*Worked on applying deep learning methods to various computer vision problems in echocardiography. Developed a model to automatically characterize the severity of aortic stenosis in parasternal long-axis view cardiac echos. Contributed to a publication on self-supervised representation learning for automatic keyframe detection and synchronization between multiple cardiac views. Extended this work in a first author publication on semi-supervised detection of atrial fibrillation with minimal labelled data. Built and distributed various tools for video data processing and electrocardiogram analysis.*

### Academic Assistant

Univeristy of British Columbia — 09/20 → current

*After previously working as a teaching assistant for Principles of Software Design (CPEN 221), I was offered to take on an Academic Assistant role allowing me to contribute directly to the development of course material.*

### Quantum Algorithms R&D

**beit.tech** — Summer 2019

*Worked to develop company IP in research areas related to quantum algorithms. Focus was held on implementation, correctness and limitations for quantum computers to solve classically hard problems. I worked on theorizing, developing and testing quantum algorithms as well as building high performance in house tools for simulation of gate-model, adiabatic and continuous variable systems.*

### Junior Mechatronics and Embedded Systems Engineer 2018

**OTI Lumionics** — Winter 2018

*Worked on various technical projects to advance the production of organic light emitting diodes (OLED). Focused on design and development of mechanical and electrical systems as well PLC based automation.*

### Teaching Assistantships

Univeristy of British Columbia

- **CPEN 221** (Principles of Software Design), 3<sup>rd</sup> year
- **PHYS 158** (Electromagnetism for Engineers), 3<sup>rd</sup> year
- **PHYS 350** (Lagrangian Mechanics), 4<sup>th</sup> year

## SKILLS

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### Languages, Frameworks & Applications

EXPERIENCED	Python, Mathematica, Java, PyTorch, $\LaTeX$
PROFICIENT	C/C++, Bash, Matlab, ROS, Go, VHDL, 8051 Assembly, Intel Quartus, LTSpice, Solidworks, OnShape, HTML/CSS, Structured Text

### Prototyping

3D Printer, Laser Cutter, Water Jet Cutter, Mill, Lathe, Various hand and power tools

### Communication

An interdisciplinary degree and diverse set of work experiences have given me the ability to communicate effectively with technical experts from various engineering and science backgrounds.

I have experience giving public presentations, including physics lectures for 100+ students and presenting work on artificial intelligence to a team of cardiologists. I also have experience conducting technical interviews.

## PUBLICATIONS

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- Echo-SyncNet: Self-supervised View Synchronization in Echocardiography  
*Fatemeh Taheri Dezaki, **Tom Ginsberg** and others*  
IEEE Transactions on Medical Imaging  
*Under Review*  
arXiv ID: [2102.02287](https://arxiv.org/abs/2102.02287)
- Semi-Supervised Learning for Detection of Atrial Fibrillation in Echocardiography  
***Tom Ginsberg**\* Fatemeh Taheri Dezaki\* and others*  
ISBI 2021  
*Accepted for conference presentation in April*

\* indicates equal contribution

## HOBBIES AND INTERESTS

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I try to spend my time off hiking in the mountains and going on long canoe trips with some occasional white water. I also enjoy reading, playing chess, skiing, rock climbing, slacklining, road biking, eating spicy foods and generally seeking out new experiences. I also enjoy travelling and have visited various places in Europe, Japan, China, the middle east, South America and I have also lived briefly in Poland and Switzerland.

## CONTACT INFO

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GitHub: [tomginsberg](https://github.com/tomginsberg)

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<sup>1</sup>Discover more info on my work and projects at my website [tomginsberg.me](https://tomginsberg.me)